

Aquilegia

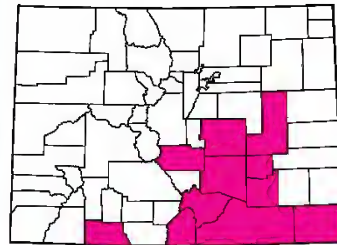
Newsletter of the Colorado Native Plant Society

Volume 42 No. 4 Summer 2018





Cane, or Tree, Cholla, *Cylindropuntia imbricata* (Cactaceae). This cactus is found throughout the Southwestern United States and in Northern Mexico. Elevation range 4400-6500 ft. in Colorado, where it is primarily restricted to the southeastern corner of the state. It can hybridize with *C. whipplei* where their ranges overlap. The many-tepaled flowers are usually magenta colored, but can range from rose-pink to dark red-magenta. The many filaments are usually green at the base, fading to cream or light magenta distally, with prominent yellow anthers. The stigmas range from cream to bright yellow. The most effective pollinators appear to be medium-to-large bees. The persistent yellow fruits are eaten by many animals and the 'trees' are important nesting and refuge sites for birds and other small animals. Cane cholla is abundant in over-grazed lands. Kelly Ambler



Map adapted from Ackerfield, J. *Flora of Colorado*, p. 257 (2015).

Botanicum absurdum by Rob Pudim



PHOTO CREDITS: FRONT COVER and PAGE 2: Cane cholla, *Cylindropuntia imbricata*. Photos taken on personal property. © Daniel Sawyer. All photos used with permission.

Aquilegia: Newsletter of the Colorado Native Plant Society

Dedicated to furthering the knowledge, appreciation, and conservation of native plants and habitats of Colorado through education, stewardship, and advocacy

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AQUILEGIA: Newsletter of the Colorado Native Plant Society

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Featured Story

Competition on the Prairie: Pollinators and Their Roles in the Landscape

By David Julie

An expanse of colorful wildflowers teeming with bees, butterflies, flies, and wasps embodies abundance and peacefulness. Nonetheless, each of these organisms competes for finite resources. Plants compete for the services of pollinators and animals compete for the food available in flowers. This kaleidoscope of interactions underlies the amazing diversity of wildflowers and the animals that visit them.

One imperative determines the traits and behavior of every organism—to produce offspring that contain copies of the organism's genes and that survive and reproduce themselves. In *The Selfish Gene*, Richard Dawkins describes organisms as “survival machines” for genes.

Sexual reproduction, in which some genes from each of two parents randomly recombine, allows advantageous mutations that occurred independently in two lineages to be merged into one individual. The incomparable power of blending amply compensates for the considerable overhead of sex.

Photosynthesis enables plants to use inorganic materials and the energy in sunlight to construct themselves and to store energy for their needs. However, because plants cannot readily move, plants require assistance to connect with a sexual partner.

We consider the sex cell that moves to another individual to be the male sex cell—pollen in plants and sperm in animals. Flows of air or water move pollen among individuals of many plant species, including grasses. However, this approach does not provide targeted transfer of pollen to conspecific individuals (members of the same species). Mutations in some plants caused their flowers to entice animal visitors that moved pollen between conspecific individuals. Eventually, sweet liquid nectar became a widespread enticement and brightly colored petals became effective advertising.

While the plant/pollinator relationship is mutually beneficial in most cases, plants are not trying to reward pollinators and almost all animals are not trying to pollinate the flowers they visit. Plants evolved enticements and advertising because the plants in which these traits arose produced more offspring. Animals usually visit flowers because they seek food for themselves or their offspring.

In many flowers, the glands that produce nectar reside deep within the flower. For example, in wallflowers the nectaries lie near the base of the pistil and in *Delphiniums* the nectaries are situated in the flower's long spur. Most animals use their tongues to suck or lap the nectar.

Most flower visitors consume nectar to fuel their activities. For example, hummingbirds, bees, wasps, butterflies, moths, and flies all eat nectar as they visit flowers. Some flower visitors, including female hummingbirds and female bees, also store large quantities of nectar in their crops, return to their nest or colony, and regurgitate the nectar to feed offspring.

Some flower visitors, including beetles and bees, consume pollen for their own needs. Female bees and female pollen wasps also intentionally gather pollen to feed offspring. Most female bees store the pollen they intentionally gather externally in hair or baskets. For example, female leafcutter bees store dry pollen in dense hair on the underside of their abdomen. Female *Melissodes* bees store dry pollen in dense hair on their rear legs. Bumblebee queens and workers and honey bee workers press pollen moistened with nectar into a hair-fringed basket on their rear legs. ▶



***Bombus occidentalis* improvising on a penstemon.**
© Diane Wilson



Epargyreus clarus on *Monarda fistulosa*.
© David Julie

◀ Female yellow-faced bees and female pollen wasps store pollen in their crop. Because female bees intentionally gather pollen for offspring and because most bees are hairy and much of their hair is branched, bees transfer a lot of pollen between flowers.

I know of only one animal in Colorado that intentionally pollinates. As Eric R. Eaton and Kenn Kaufman describe in the *Kaufman Field Guide to Insects of North America*, a female yucca moth gathers pollen and deposits it on the stigma of a yucca flower then lays eggs that hatch into larvae that eat many of the seeds that develop.

Flower visitors other than yucca moths pollinate incidentally, if at all. Pollen adheres to their bodies as they visit flowers and the pollen brushes against or falls onto the stigma as they visit a conspecific flower. Many flower visitors do not pollinate effectively. For example, pollen might not adhere to a location on the animal from which the pollen can be transferred to the stigma of another conspecific flower. Or, the animal does not subsequently visit conspecific flowers.

A plant species evolves flowers whose enticements (visibility, fragrance, shape, size, and complexity) yield maximum pollination from potential animal visitors in the community. The traits must be cost-effective and must compete effectively for pollinators with other plant species in the community.

Why hasn't evolution produced one standard flower and one standard pollinator?

A variety of plant species evolve because they have differing traits that make them optimally suited to their niche. If all these species had a standard flower, most of the animal visitors to a flower would transfer heterospecific pollen (pollen from other species). Without conspecific pollen, seed production would be poor. A flower's stigma can even become clogged with

heterospecific pollen, obstructing subsequent pollination by conspecific pollen. Finally, most of a plant's investment in nectar and pollen would be consumed by flower visitors that might not visit conspecific flowers.

Just as animals evolve traits, like varied songs and plumage in birds that enable them to locate and recognize potential mates of their species, plants that depend on animals for pollination evolve variable flowers to encourage those animal visitors to move pollen between conspecific individuals.

For example, many flowers in Asteraceae contain central disk flowers that must be individually pollinated. Each disk flower contains small quantities of nectar and pollen. A butterfly can quickly suck nectar from the numerous disk flowers without having to fly between flowers.

Flower Constancy

The narrowness of tubular flowers, such as penstemons and delphiniums, excludes many short-tongued animal visitors from accessing nectar and forces long-tongued animal visitors to brush against the flower's anthers, daubing them with pollen.

Bees especially favor flowers that have yellow or purple petals. White flowers attract moths. Red flowers draw hummingbirds.

"Flower constancy" refers to the tendency of an animal to visit flowers of the same species. Complex flowers promote flower constancy. Many animals instinctively visit flowers for food but the animals must learn the location of pollen and nectar in the flowers of each species. Once an animal invests the time to learn how to efficiently access food in a flower, the animal tends to continue visiting conspecific flowers as long as most of the visited flowers contain food. Highly complex flowers, like those in Fabaceae in which a keel encloses the nectaries and stamens, frequently offer profitable visits because relatively few animals learn how to process them.

Flowers that offer little nectar might receive fewer animal visitors than flowers that offer more nectar. However, a flower that offers excessive nectar might sate its animal visitors, making them less likely to continue foraging and pollinating. After an animal consumes a flower's nectar, the plant takes time to resupply the flower's nectaries.

Evolved Enticements

Some plants don't offer nectar at all. Expert lepidopterist Paul Opler noted that some *Eriogonums* don't offer nectar, depending for pollination on female bees that visit to collect pollen for offspring. ►

◀ Plants have also evolved enticements other than food. In the tropics, the shape and scent of certain orchid flowers causes some male orchid bees to mistake the flowers for female orchid bees. As the males try to copulate with the flowers, the anthers deposit packets of pollen on the bees. As the male bees attempt to copulate with successive orchid flowers, they pollinate them.

Like orchid flowers, milkweed flowers package their pollen into pollinia rather than releasing individual pollen grains. Milkweed flowers have slick surfaces and contain abundant nectar. A visiting insect's leg sometimes slips into a slot near the flower's base. As the insect pulls its leg out of the slot, two pollinia become attached to the leg and might be subsequently transferred by the insect to a conspecific flower. A weak insect that cannot extract its leg eventually perishes. I find a trapped, dead honey bee worker every few days during the bloom period for *Asclepias speciosa*.

A long-tongued animal visitor enters a tubular flower because the animal can most efficiently access the nectar by entering the flower. Some short-tongued animals, including *Bombus occidentalis*, use their jaws to chew a hole in the corolla through which they insert their tongue to access the nectar. The commonly-used term for this behavior, "nectar robbing," misleads because it assigns human ethics to the natural world, where only the imperative to reproduce matters. No obtainable opportunity remains unexploited for long.

Heat also acts as an enticement to animal visitors. Insects require a minimum body temperature to fly. On cool days, a heliotropic flower like a sunflower or an alpine flower that uses chemical reactions to elevate its temperature might be more attractive to potential pollinators than flowers at the ambient temperature. Warmer flowers might also emit more scent and develop seeds faster.

So Many Bees

The Museum of Natural History at the University of Colorado has documented approximately 950 species of bees in Colorado. Most can be viewed as either solitary, eusocial with an annual colony cycle, or eusocial with a perennial colony cycle.

A female solitary bee mates, then provides for her offspring without assistance. She selects a safe nest site, constructs a cell, stores a mass of pollen and nectar, then lays an egg and closes the cell. The egg hatches into a larva that consumes the pollen and nectar, then spins a cocoon and enters the pupal stage which uses natural antifreeze to survive cold winter temperatures. The new adult emerges the following year.



Megachilid bee carrying a petal fragment she just cut from *Argemone polyanthemos* to line or close a nest cell. © David Julie

About two dozen species of bumblebees live in Colorado. A mated queen overwinters alone and founds a colony without assistance in the spring. She gathers pollen and nectar, which she feeds to her first brood. These females become workers that help her raise subsequent broods of workers and eventually new queens and males. The new queens and males mate with members of other colonies. At the end of the season, the existing queen, workers, and males all die. Only the new, mated queens survive the winter to begin the cycle again the following spring.

European settlers first brought the honey bee to North America. The only bee species in North America that makes honey, honey bee workers evaporate water from nectar until its sugar concentration becomes high enough to inhibit spoilage. This honey sustains the queen and a huge population of female workers through the winter.

Honey bees' amazing attributes make them formidable in the competition for pollen and nectar among animal visitors to flowers. A human-managed hive typically has 40,000 workers. Honey bee workers use their waggle dance to communicate the location of flower patches to nestmates.

In contrast, bumblebee worker populations must be re-established every year and grow to only a few hundred per colony at most. Nonetheless, bumblebees have some impressive individual adaptations of their own. Bernd Heinrich describes in *Bumblebee Economics* that bumblebees can forage in cool weather because they raise their body temperature by shivering their flight muscles. Bumblebees can also "buzz pollinate," grasping a flower and vibrating to release pollen, making them excellent pollinators of nightshades like tomatoes, eggplants, and peppers.

"Competition..." continued on page 15 ►

Featured Story

The Hedgehogs: Irresistible Cacti

An Essay

By Panayoti Kelaidis

As I travel to distant places, I'm always amused how people struggle to grow what they shouldn't and how they sometimes ignore the obvious in their own back yards. In 2013, I visited 12 botanical gardens in Germany, every one of which had a "cactus garden." They struggle to grow cacti in their humid maritime climate, as some of us torture rhododendrons in our steppe climate. I even stayed a few days with Hans Graf, whose amazing nursery Kakteengarten in Oettingen (Bavaria), grows tens of thousands of hardy American cacti for the German market—many originating in Colorado and most of which are not available for commerce here.

A few years ago, a troop of Girl Scouts was responsible for nominating *Echinocereus triglochidiatus* to be the official state cactus of Colorado. I would have preferred *Pediocactus simpsonii* myself, since our mountains undoubtedly hoard the lion's share of that cactus, while the claret cup is pretty widespread across the Colorado Plateau and Southwest generally. The Legislature went along with the youngsters, so I suppose we must too.

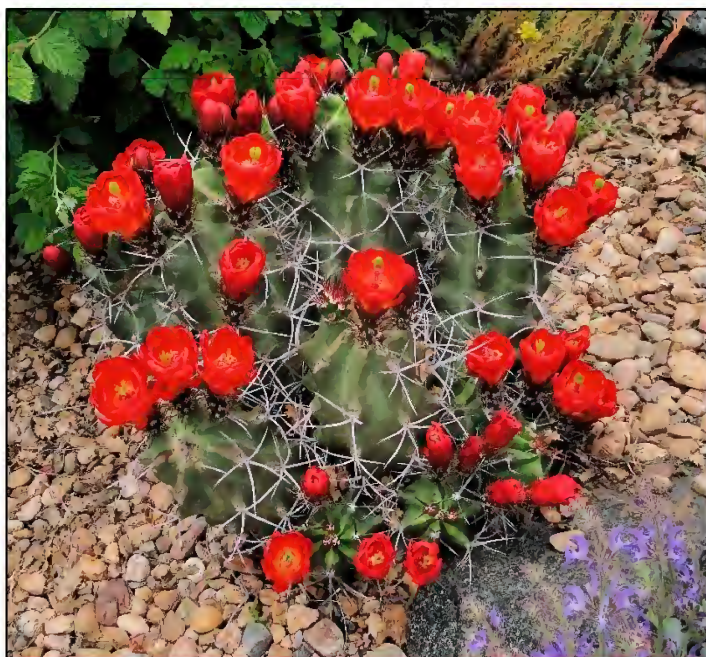
The genus *Echinocereus* is quite vast (especially in Mexico) and has many common names—although they are generally referred to as hedgehog cacti, and they're as cute and cuddly as real hedgehogs, albeit more native in their origins! Unlike nasty *Opuntia*, which have glochids, *Echinocereus* are often quite easy to handle, and aside from a few with hefty spines, most can be held in one's hand without writhing. Best of all, they are adaptable and easily grown: I have dozens of accessions of the principal species native to Colorado growing in my xeriscapes, and many outdoors in pots where they can survive with minimal or no supplemental irrigation.

There was a time when people collected plants in the wild with relatively clean consciences; this is a long time ago, when there were more plants out there than people. Cactus lovers were especially guilty of collecting plants in the wild, and Dr. William Weber harshly excoriated the "rock garden trade" in the introduction to several editions of the *East Slope Flora* for decimating wild populations of ball cacti.

I suspect development and farming have had a far greater impact, but though abuses still occur (particularly in Mexico where well-meaning conservationists have tried to teach villagers to show their rare cacti for eco-tourism, and they've discovered that tourists pay even more if you dig up cacti for them). The Cactus and Succulent Society of America has made enormous strides to eliminate wild collection of plants. In fact, they don't allow field collected specimens to be shown at shows.

There's really no reason for any of us to collect hedgehog cacti in the wild. A half dozen local nurseries are propagating tremendous numbers and selling them very reasonably at garden centers. Nursery grown plants are much healthier and cleaner than wild specimens and quickly attain respectable size in the garden.

There are five (or perhaps a few more) wild hedgehog cacti in Colorado. Their miracle flowers rival roses and orchids in splendor, and their attractive form is appealing year around. All of these grow in



Echinocereus triglochidiatus v. *gonacanthus*
© Panayoti Kelaidis

◀ Denver area gardens. I have also seen them thriving in Michigan, Vancouver and Kansas City gardens. I've seen thousands for sale in Oettingen, Germany. It is a pity they are so rarely seen hereabouts where they really belong, and thrive without fuss or bother.

Panayoti Kelaidis is senior curator and director of outreach at Denver Botanic Gardens where he's worked for 40 years this past April. He was born in the Yampa Valley and grew up in Boulder, and has loved seeking out (and growing) wildflowers all his life.

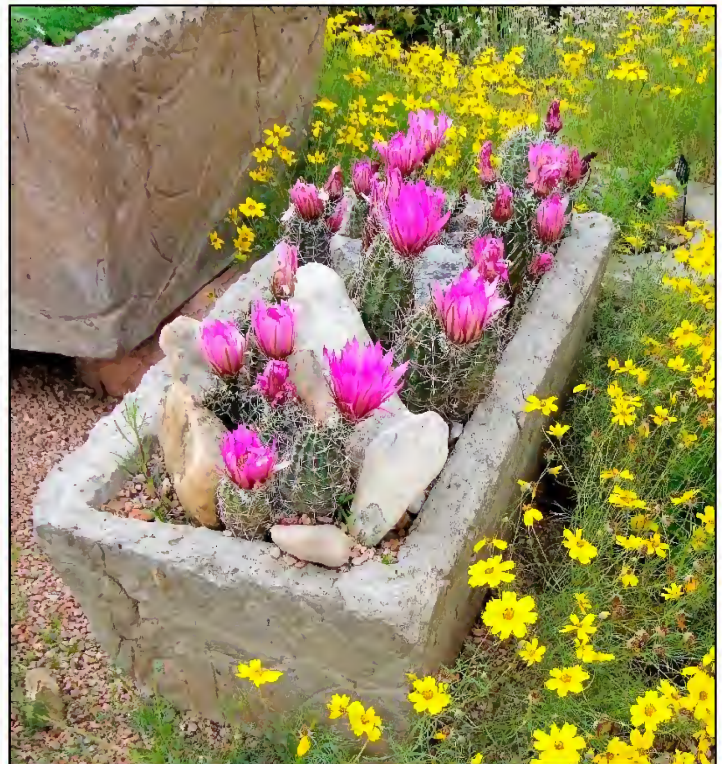
Colorado's State Cactus

In 2014, Governor John Hickenlooper signed House Bill 14-1024, designating the state cactus as claret cup cactus (*Echinocereus triglochidiatus*). Four Douglas County girl scouts from Castle Rock Troop 2518 initiated the act.

Other common names for *Echinocereus triglochidiatus* are hedgehog cactus, king's cup cactus, and strawberry cactus. Other fun facts include:

- Hummingbirds are the primary pollinators;
- The fruit is edible;
- It is a popular addition to rock gardens; and
- It grows in elevations from 4500 to 8800 feet.

MM



Echinocereus fendleri in a trough
© Panayoti Kelaidis

In Memorium



Ronald L. Hartman (February 11, 1945 – June 30, 2018) spent 38 years as curator of Rocky Mountain Herbarium and Professor of Botany at the University of Wyoming, having 52 graduate students over his career.

Botany and his colleagues were

always his first loves. He was honored to receive the Lifetime Achievement Award from the Colorado Native Plant Society (2010), the certificate of Dedication of the "Ronald L. Hartman Excellence in Wyoming Botany" by the Wyoming Native Plant Society (2015),

the Distinguished Service Award from the American Society of Plant Taxonomists (2016), and the Wyoming Biodiversity Science Award (2017) for his lifetime body of work.

Ron also earned emeritus professor status upon his retirement from the University of Wyoming and continued volunteering his time in the Rocky Mountain Herbarium daily. During his years as a botanist, he authored and co-authored many plant taxonomy publications and contributed several treatments to the *Flora of North America* volumes, the *Intermountain Flora*, and *The Jepson Manual*, with two genera (*Elaphandra* and *Hartmaniella*) and two species (*Hartmaniella sierrae* and *Hartmaniella oxyphylla*) named for him.

He is survived by his wife of 30 years, T.J. Poll, and his son, Jakota Hartman (both of Laramie).



Botany Basics

Colorado Life Zones By Lenore Mitchell

CoNPS has a diverse membership — from professional botanists to hobbyists to beginning native plant lovers or gardeners. To meet the needs of members learning to identify native plants, Aquilegia features this regular column on basic botany.

This state we call home has a wide range of elevations and microclimates, which result in an amazing array of very different plants. Before deciding where to hike and enjoy plants, consider that Colorado has over 10,000 feet of elevational gain from its eastern prairies to its highest peak of 14,440 feet (Mt. Elbert, part of the Sawatch Range). Mt. Elbert is also the highest peak in the entire 3000 mile-long Rocky Mountains that extend from Canada to New Mexico. Even so, California's Mt. Whitney, located in Sequoia National Park, is part of the Sierra Nevada Mountain Range and, at 14,505 feet, is the highest peak in the lower forty-eight states. But Colorado boasts fifty-three "14ers," as well as over seven hundred peaks exceeding 13,000 feet. Traveling from the plains to the peaks here is similar to traveling from Mexico to Alaska!

Another prominent feature of Colorado topography is its portion of the Continental Divide, which meanders over many of our high mountains, topping out at 14,278 feet on Grays Peak, meaning Colorado also has the highest peak on the North American portion of the Divide. This long topographical feature originates in Alaska's Bering Strait and extends down through Canada and the western US into Central America and on through South America's Andes Mountains, ending at Patagonia and Tierra del Fuego.

The Continental Divide is a largely mountainous feature and also a hydrological divide with water from the western side flowing eventually to the Pacific Ocean and from the eastern side flowing to the Gulf of Mexico. More specifically, though, the northernmost portions of the Divide drain into the Arctic Ocean while

some of the easternmost portions drain into the Gulf of Mexico and the Caribbean Sea as well as the Atlantic.

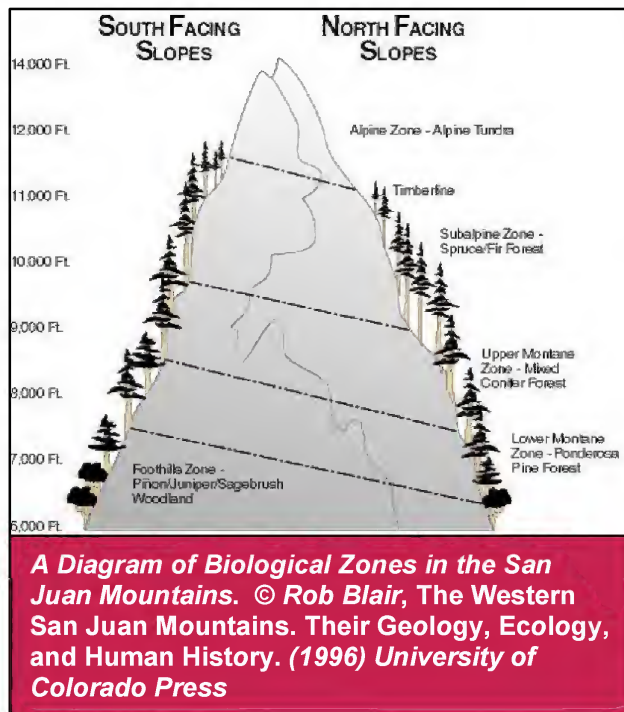
What do life zones have to do with plants, and where and when to find blooms?

For one thing, Colorado's dizzying array of elevations leads to a diverse flora as well as to seasonal complexity. Spring may be defined by a specific date on the calendar, but when heading to the high mountains on March 20 (the official date of the Spring Equinox), one is more likely to encounter skiing rather than botanizing. A few lower elevation flowers bloom as early as March, therefore flower finders will want to consider life zones before deciding where to find the first *Claytonia rosea* (spring beauty) or *Anemone patens* L. var. *multifida* (pasqueflower).

A life zone is a geographic region with a distinct set of plants and animals, yet changes in geographical regions are not abrupt, and plants have varying adaptabilities.

Colorado's five life zones include the:

- Plains 4,000 to 6,000 feet (east of the Divide);
- High Desert 5,000 to 7,000 feet (west of the Divide);
- Foothills 6,000 to 8,000 feet;
- Montane 8,000 to 10,000 feet;
- Subalpine 10,000 to timberline (approximately 11,500 feet); and
- Alpine (above timberline).



It is important to remember that plants respond to immediate conditions, not exact elevations.

Microclimates are important to consider, too, and can be as small as a rock that provides shade or warmth to several plants, or as enormous as entire mountains, which often have thick forests on the northern sides while their southern exposures may often be more barren due to hotter sun and less moisture reaching into plant roots.

◀ Going up 2,000 feet in elevation equals about the same difference in plant growth as traveling about six hundred miles north. Life zones begin at higher elevations as you go south and at lower elevations as you go north. For instance, Glacier National Park near the Canadian border in Montana experiences timberline at around 8,000 feet and portions of northern Alaska experience timberline on the tundra near sea level.

Localized response to different exposures and other factors also influence plant survival and growth. Temperature decreases approximately three degrees Fahrenheit for each 1,000 feet higher in elevation, which is why we head to the cooler mountains in summer or fly to southern Arizona for a warm winter vacation.

Because plants are literally rooted to one place, they must adapt to the seasons in various ways. Herbaceous plants go into winter dormancy by losing most above-ground portions of the plant, while roots remain alive. Deciduous trees endure winter by shedding their leaves. Evergreens retain most of their needles and may take advantage of warm winter periods by occasional photosynthesis. Plant survival in any season depends on various factors, including:

- Water availability;
- Humidity;
- Slope aspect (direction);
- Soil type, composition, and pH;
- Prevailing winds;
- Invasive alien plants and insects;
- Microclimates;
- Animal disturbances, grazing, and digging;
- Seed dispersal and viability;
- Human disturbances such as hiking, biking, off-road vehicles, development, and more; and
- Hazards such as drought or fire.

So how do we decide where and when to go for a nice hike and see a few blooms?

Actually, considering all the above factors provides ideas about where and when to find wonderful wildflowers and fabulous forests. Keep in mind that plants break dormancy out on the plains about a

month before the foothill and montane plants, and well before the subalpine and alpine beauties show themselves.

General ideas about where plants originate:

- Plants and flora east of the Divide mainly come from the northern and southern Great Plains;
- Riparian areas (streams, rivers, lakes) run between all zones and carry elements such as seeds from one zone to the next;
- Montane zone corresponds to the Canadian zone (latitude 50-60);
- Subalpine zone corresponds to the Hudsonian zone (latitude 60-66); and
- Alpine zone corresponds to the Arctic zone, north of the Polar Circle (latitude 66).

Wherever hiking, remember to pay close attention to ecotones, or transition areas between two ecosystems (such as where a forested area gives way to a meadow). Places where two communities meet and integrate often display a good array of plants and animals from both area types.

Explore different life zones

Check local county open space and state park sites as well as national forests for specific trails. Look online for field trips led by CoNPS volunteers or just find a partner, pack your gear (including a hand lens) and get out there!

Although it is nice to try different trails and different altitudes, it can also be fun to visit one particular trail every week or so throughout the season to observe the changing palate of plants in one location. And by the way, if you're a gardener, observing where plants grow in the wild can help you decide which natives might be successful in your home setting.

Lenore Mitchell is an avid amateur who has taught Native Plant Master® courses through CSU Extension's Jeffco office for more than twelve years and has presented courses for Osher Lifelong Learning Institute (OLLI) at Denver University, and other programs. She says teaching is a great way to keep learning. She's also the current Metro-Denver chapter president.



Plains to timberline. Rocky Mountain Arsenal Wildlife Refuge. © Kelly Ambler

Corner

Native Plants Take Root in Colorado Residential Landscapes

By Connie Clem

"This is Colorado. Let's garden that way!"

If only it could be that easy to get people's attention.

Population growth is accelerating in many parts of our state, and just as the best time to plant a tree is 20 years ago, now is our best chance to inspire the nature-based residential landscapes of tomorrow. Colorado seems to be at an especially pivotal point these days, with new subdivisions rising while our local climates are getting warmer and weirder. It is more important than ever to grow wisely.

Many of us "get" the reasons why gardening native is resource-smart, and how well-chosen natives in the home landscape can connect us meaningfully with our unique Colorado terroir. And we hope that this viewpoint is taking hold outside the botanist bubble. The good news is, we can see a well-rooted series of campaigns in government, in the nonprofit space, and in green industry.

State Government

Native plants gained some visibility when Governor John Hickenlooper proclaimed June 10–16, 2016 as Native Plant Week, setting a precedent for celebrations in later years. Colorado's Water Plan, launched in 2015, also furthers the use of native and xeric plants. Applications for CPW grants are due August 1, 2018, and February 1, 2019 (see link at the end of this article). The Colorado Revised Statutes include five mentions of the term "native plant," such as CRS 39-22-4401, a tax code provision allowing for voluntary donations to the Colorado for Healthy Landscapes fund. This is a checkbox on the Colorado State Income Tax Return.

The CSU-sponsored Native Plant Master Program® is enjoying a strong educational reach in most of its 12 participating counties. New NPMs in 2017 contributed more than 3,000 hours of outreach time to share what they have learned with others. They and CSU Extension staff reached about 16,000 Colorado residents last year. The program also improved more than 33,000 acres via sustainable landscaping or alien invasive weed control in 2017 alone.

Community: Growing Interest in Native Plant Gardens

Any article on native plant education is remiss if it does not mention the Denver Botanic Gardens. DBG has added repeat offerings of its popular classes on native plants to meet increased demand. It aims to educate and inspire gardeners to help people realize they do not need to sacrifice ornamental beauty when they use natives, and that there is more to the prairie than grasses. More and more homeowners are replacing bluegrass turf with native and water-wise plantings. Plant Select® choices are among the earliest to sell out at DBG's spring plant sale.

Audubon Rockies, with its Habitat Hero program, is another ally of native plants. AR collaborates with CoNPS by co-hosting annual garden tours, offering workshops, cross-pollinating events, and exchanging articles to reach each other's readership and audience on the social media.

Jamie Weiss, Habitat Hero coordinator, says that collaboration and partnerships are its best tools for promoting the benefits of cultivating native plants. When organizations collaborate on native plant promotion, each organization "has its own lens." Each group reaches a different demographic and contributes its unique expertise. Plus, each has a community of volunteers to mobilize for projects such as HH's five demonstration gardens. In 2016 and 2017, Habitat Hero volunteers installed more than 60,000 plants and improved almost 300 acres. Nearly 7,000 participants attended their workshops. The Visitor Center Garden in Loveland, planted with help from volunteers, has garnered 20,000 visits in a single year. And to date more than 250 gardens have been awarded Habitat Hero designation. ►



This Colorado Springs yard was recognized by Habitat Heroes in 2014 as an enjoyable place for wildlife, and people alike. © Audubon Rockies

◀ CoNPS also is reaching more area gardeners. Orders for the spring plant sale more than doubled in each of the last two years. Two-thirds of the registrants for the spring 2018 conference on landscaping with native plants were in the homeowner segment and the other third in the green industry. Each year, the conference has moved to a larger venue to accommodate growing interest, and seats have sold out. The next conference in the series will be at Denver's Auraria campus with a capacity of 500 registrants on February 16, 2019.

CoNPS has awarded mission grants for reaching the gardeners of today and tomorrow. One grant went to the Colorado Foundation for Agriculture, for distributing a Colorado Reader publication about native plants for 1,500 Colorado schools, and a second grant to launch a Legend High School club for native plants and environmental issues in Parker.

CoNPS also is inviting Colorado residents to contribute to an important long-term project to monitor the performance of native plants used in residential landscaping. See <https://conps.org/gardening-with-native-plants/> to get started.

Industry: Native Plant Awareness Penetrates the Colorado Garden Marketplace

Green industry organizations also are leading the way for their members and consumers. The Associated Landscape Contractors of Colorado has had a long-time focus on sustainability and water-wise landscapes. Its June 22 Tip of the Week email focused on why it's "cool" to go native, concluding "When we add more natives in our yards, we're being Colorado-friendly, have less maintenance to do—and we save water." ALCC had a spot on native plants on Denver's 9news channel on Saturday, June 23, that can be viewed on the 9news website.

Landscaping-focused studies conducted by the real estate website Houzz showed that homeowners have objectives that native plants clearly can meet. One study found that 16 percent of survey respondents nationally were concerned with the challenges of drought/water shortage, and 18 percent wanted solutions for excessive sun. In the arid west, those numbers can only be higher.

In another study, Houzz reported that:

- 76 percent of respondents preferred low maintenance landscape plants;
- 69 percent wanted flowering plants;
- 52 percent wanted insect- or bird-attracting plants;

- 51 percent wanted native plants specifically;
- 45 percent wanted drought-resistant plants;
- 34 percent wanted edible plants; and
- 30 percent wanted cold-resistant plants.

Of course, natives can answer each of these needs.

Jesse Eastman, owner of the Fort Collins Nursery, agreed that his company's expertise on native plants is an asset.

Says Eastman, "Native plants are still a fairly niche market, so having expertise in this area is a great way for us to stand out. It is often our most educated and well-informed clients who are the most passionate

about including native plants in their landscapes, and being able to serve them well means they tell other people about us too!"

He also affirmed that more customers are discovering the benefit of native flowers as a food source for pollinators, leading to an

uptick in sales of native plants. Reduced water usage and habitat creation are other top goals of his customers.

Eastman adds, "We have a section of our nursery that is dedicated exclusively to native plants, and just by separating them it raises questions and creates opportunities to educate customers. We also have classes and workshops that touch on native plants, low-water landscaping, and landscaping for wildlife habitat. More classes would be great, but time and space are limited."

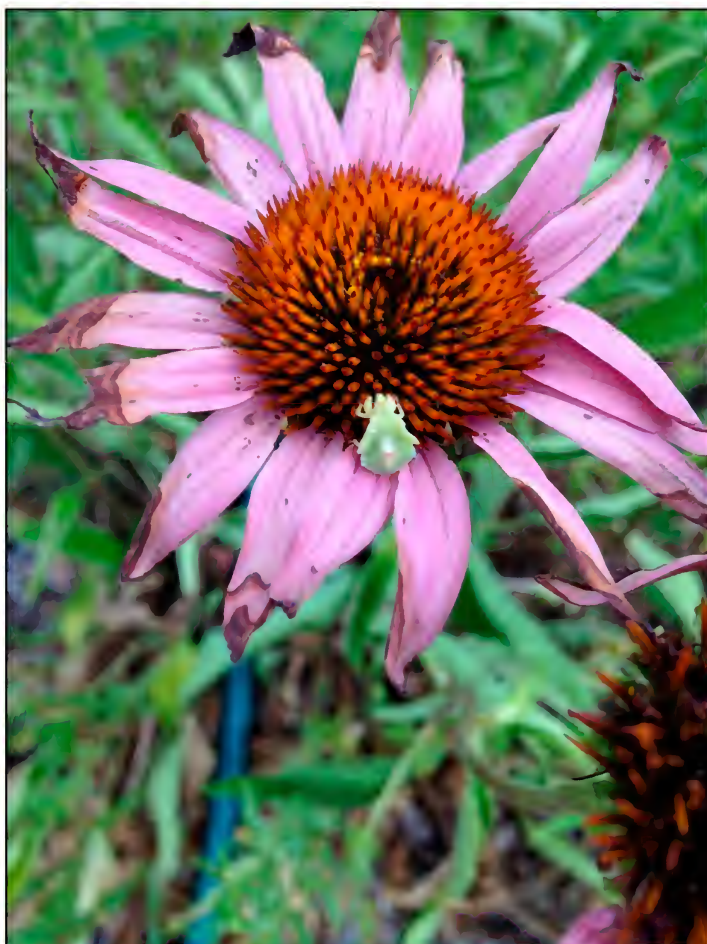
Of course, there is more educating to be done and there are more ideas to be found or hatched. It never hurts to apply a little more leverage to hasten the paradigm shift.

Home owner associations (HOAs) can be an effective leverage point. In June 2018, Plant Select® gave its first HOA Partner Award to Denver's Cherry Creek 3 neighborhood. Cherry Creek 3 also received a bronze award in 2016 in the Colorado Environmental Leadership Program. HOA interest is still gathering steam in Colorado, but HOAs elsewhere, such as in Austin, Texas, have required the use of native plants for many years.

A recent post from the Lady Bird Johnson Wildflower Center talks about how to "Sway Your HOA." Presentations that link water use and cost savings can provide an additional "aha" moment. For example, the Cherry Creek 3 project is on record as saving 15 million gallons of water and \$100,000—no small change.

"When we add more natives in our yards, we're being Colorado-friendly"





Echinacea purpurea and insect. © Connie Clem



Growing It Forward

For water usage and pollinator habitat, adapted plants are an acceptable choice, but native plants are best for the native bees and butterflies in Colorado. Insects may be more charismatic than plants to some people, but “We’ll take the interest any way we can get it,” says Deryn Davidson of the CSU Extension Office in Boulder County.

To grow more interest, any of us with some free time can partner with a local library, community center, or kids’ summer program and share what we know. Organizations need programming, and the plants need your advocacy. Show participants that it is not that hard to find the right plants, once you know what you are looking for. Many natives can survive and thrive under a variety of conditions and therefore make good ambassadors and confidence-builders. We can share seedlings, or grow extras, for sale or giving at annual neighborhood swaps and sales.

One of the challenges in raising demand for native plants is the ability to meet that demand. One perhaps less expected solution is under way in Oregon, where the state is employing prison inmates in the

propagation of native plants for restoration. Talk about making a difference.

Lady Bird Johnson put it this way: “Wherever I go in America, I like it when the land speaks its own language in its own regional accent.” Three cheers for more use of Colorado natives for all they give us.

Connie Clem writes on public policy issues, inside and outside. She’s making her corner of Niwot native again. Connie can be reached at connie@cleminfostrategies.com or (303) 242-6278.

Helpful resources:

<http://www.coloradowaterplan.com/> ; see also <https://www.colorado.gov/pacific/cowaterplan/integrating-water-land-use-planning> and <https://www.colorado.gov/pacific/cowaterplan/colorados-water-plan-grant-fund>

CRS 39-22-4401, Legislative declaration in the tax code allowing for voluntary donations to the Colorado for Healthy Landscapes fund, <http://bit.ly/2IJRJSj>

CSU Extension Native Plant Master Program information, <https://spark.adobe.com/page/Y7O3IVwc1Q070/> and Impact report, <http://extension.colostate.edu/docs/comm/impact/npm-2017.pdf>

<https://www.botanicgardens.org/education/adult-programs/rocky-mountain-gardening>

<http://plantselect.org/>

<http://rockies.audubon.org/habitat-heroes> and

<http://rockies.audubon.org/programs/habitat-hero-education>

CoNPS monitoring project, <https://conps.org/gardening-with-native-plants/>

ALCC Tip of the Week, June 22, 2018,

<http://campaign.r20.constantcontact.com/render?m=1101178492165&ca=6d842550-4d56-4eec-a2a5-3ccb406d4b0d>

“Experts suggest native plants for your garden and yard,” ALCC presenter, originally aired June 23, 2018, (00:3:12 video) <https://www.9news.com/video/life/home-garden/experts-suggest-native-plants-for-your-garden-and-yard/73-8169362>

http://www.alcc.com/index.php?option=com_content&view=article&id=720:hidden-value-of-landscapes&catid=24:sustainability

http://www.cherrycreek3.com/Awards___Honors.html

“Sway Your HOA,” Pam Penick, Lady Bird Johnson Wildflower Center, Feb 28, 2018,

<https://www.wildflower.org/magazine/landscapes/sway-your-hoa>

Considering Native Plants for Your Association,

<http://www.hoamanagement.com/considering-native-plants-for-your-association/>

<https://www.fcgov.com/naturalareas/native-plants.php>

CSU PDFs on native plant topics,

<http://extension.colostate.edu/topic-areas/natural-resources/?target=publications#native>

Houzz studies,

<https://www.houzz.com/ideabooks/83071112/list/data-watch-how-people-upgrade-their-yards-and-what-they-spend>

Oregon Department of Corrections Sustainability Plan 2017-2022 (Five Year Plan), <https://lnkd.in/gCCqXtj>

Conservation Projects in Prison: The Case for Engaging Incarcerated Populations. (2015) T.N. Kaye, K. Bush, C. Naugle and C.J. LeRoy. *Conservation and Science. Natural Areas Journal*, 35:90-97

Is it Perennial Flax or Lewis's Flax?

Linum perenne or *L. lewisii*?

By Jim Borland



Close up of *Linum lewisii*. The plant was named by botanist Frederick Pursh in 1814 in honor of Captain Meriweather Lewis, who documented and collected the plant in 1806 during his exploration of the Pacific Northwest. © Jay Austin

It begins blooming blue at the end of May and continues sometimes into red-hot August. Although tough enough to compete with that grass on whose broad leaves is branded a "W" or an "M" (smooth brome), depending upon the viewpoint of mouse or man, its sky-wide petals are unable to endure even the coolest of the warm sun before they drop like so many shards of the most delicate Wedgewood plate. By midmorning, even the bluest of flax fields return green when all petals fall.

Blue flax is common in foothills from Saskatchewan and Alaska south to New Mexico and California where it occupies lands from the plains through the upper montane. Showing little or no preference for slope aspect and little for slope angle, blue flax has a minimal root system with most fibrous roots only five inches deep and the occasional taproot down to only 20 inches deep.

While the plant is known and sown widely as blue flax, its scientific, botanic, or Latin name has gone through the taxonomic wringer. Is it *Linum perenne*, one of its subspecies, or *Linum lewisii*, a separate and distinct species from the common blue flax of Europe? Those who believe that it is *Linum perenne* either fail to note or fail to recognize the importance of the difference in the way the reproductive parts are fashioned.

The blue flax of both the European and Colorado foothills produce, at best, 10 seeds per flower per head or two seeds per each of the five pistils or pollen collectors. Where the two plants differ is in the length of the style supporting each of the pistils. The European styles are all the same length (homostylus) whereas the styles of the foothills blue flax differ in length in the same flower head (heterostylus).

Another feature important to some is the fact that European plants are self-incompatible, meaning that

"Flax..." continued on next page ►



Flowers of *Linum lewisii* (and *L. perenne*) can vary from nearly white to pale blue and even dark lavender. © Jay Austin

Native plants in the garden provide food for pollinators

Including native plants in gardens helps support native pollinators. Standard guidelines apply, like selecting plants from several families and with staggered bloom periods. A gardener can also use knowledge and observation to support specific pollinators. For example, monarch caterpillars only eat milkweed leaves. Along the Front Range, growing *Asclepias speciosa* makes the biggest impact.

In *A Sting in the Tale*, Dave Goulson advocates growing plants in the Fabaceae family because bumblebees value their protein-rich pollen. Burly bumblebees seem more adept than svelte honey bees at processing *Thermopsis divaricarpa*. Likewise, relatively short-tongued honey bees seem unable to drain the nectar from *Onosmodium bejariense*, *Monarda fistulosa*, and many *Penstemons*, leaving some resources for long-tongued bumblebees and *Melissodes* bees.

Author's note: Thanks very much to Carol Ann Kearns (2015), Paul Opler (2015), David Inouye (2016), and Nick Waser and Mary Price (2016) for sharing their expertise about pollination and pollinators in talks at CoNPS annual conferences.

David Julie enjoys spending time with his partner Kate Goes In Center, who also loves to observe and learn about native plants and native insects. They also enjoy providing nature programs, especially to children.

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they cannot successfully set seed by fertilizing themselves. The foothills blue flax can successfully fertilize itself and is thus the choice plant for seed growers. Some taxonomists believe that these reproductive differences are sufficient grounds for separating our blue flax from its European cousin and have named ours *Linum lewisii* in honor of Captain Meriwether Lewis who first found the plant near the Continental Divide. Others simply leave the plant among those of the long ago discovered European *Linum perenne*, and others, who wish to note the differences but not a new name, place it as a variety or subspecies of *Linum perenne*.

By the way, most, if not all, the blue flax seed on the market today is derivative of seed originally collected in Idaho, tested by Plant Material Centers, the Soil Conservation Service, and the U.S. Fish and Wildlife Service. It is named 'Appar.'

While the taxonomic naming wars continue, at least one locally prominent botanist further fueled the fires by taking blue flax out of the genus *Linum* and placing it in the genus *Adenolinum*. Who said that common names are confusing?

Jim has been fooling around with native plants for more than 40 years in private, commercial and public venues. His home garden contains 1,000s of native plants, most grown from seed at home and now not supplementally watered for 20 years. Jim has written hundreds of articles, given talks too numerous to count and continues to grow and plant the two or three native plants not yet in his garden.

Editor's note: Flora of Colorado (2015) places blue flax's species in the Linum genus. Colorado Flora (2012) places blue flax in the Adenolinum genus.

About the photographer

Jay Austin's mother was a lover of wildflowers and cultivated them in the forest and the meadows near the house on their Tennessee farm. When he was a child, she took the time to teach him the names, where they liked to grow, and how they propagated. When Jay moved west to Nebraska and then Colorado, the landscape was different and so were the flowers. He says it was exciting to have an opportunity to become much more familiar with the western beauties, thanks to programs offered by Colorado State University's Extension program.

When Jay retired from managing three of the Montrose radio stations for Cherry Creek Radio, it allowed more time for him and his wife Eileen to continue their hobby of photographing wildflowers. Jay enjoys leading the spring wildflower walks for the Black Canyon of the Gunnison National Park, and volunteering in the visitor's center. "It provides me the opportunity to share my enjoyment of flowers with others," said Jay.

Research and Reports

Evaluation of Wild Hop (*Humulus lupulus* L.) Genetic Diversity

Joshua Havill, a PhD student at the University of Minnesota, is looking for wild hop specimens for a special project. He plans to evaluate and describe the genetic diversity of native hops (*Humulus lupulus* L.) populations of North America and provide germplasm resources to the United States Department of Agriculture representing unique localities previously unsampled. He hopes to gather samples from Colorado, Wyoming, South Dakota, Nebraska and Minnesota for this study.



Humulus lupulus L. ripens on the vine in a native plant garden.

© Mary Menz

Havill says that little is known about wild hops growing in the central US. The USDA maintains a collection of wild hop plants and seeds, but these collections, in many cases, are a decade or older.

"The viability of these materials is slowly degrading with many of the collections no longer available," said Havill.

He contends that native populations adapted to the central US represents an area in the extant germplasm collection that is poorly-sampled and poorly understood as a result. This is also a germplasm group that experiences unique environmental conditions compared to where hops are currently grown for commercial purposes. Collection and evaluation of these materials for their genetic and phenotypic diversity is the first step to determining their usefulness as breeding material, said Havill.

He hopes this project will provide a thorough understanding of the genetic diversity found present in native North American hop populations and the development of new germplasm resources for researchers to evaluate in the future.

Havill is collecting seed from the inflorescences and rhizomes under greenhouse conditions, sampling to isolate DNA, and performing genotyping-by-sequencing to examine population structure and diversity of native hops in the central US. These plants

will also be compared against a larger panel of native hops originating from the western US and upper midwest.

How CoNPS Members Can Help

Havill encourages CoNPS members to gather samples as they come across wild hops. He welcomes collections of plant samples of up to 100 grams of fresh hop cones (female flowers) (~3.5 oz) and rhizomes from individual plants (if more than one plant is encountered).

When sampling rhizomes, make sure to sample plants that are more than 25 feet apart unless they are obviously different (male versus female plants, for instance). If no cones are present, rhizome cuttings are sufficient. Havill also requests GPS coordinates for each sample collected. He says to place rhizomes wrapped in a moist paper towel in a sandwich bag before shipping. Hop cones can be placed in gallon freezer bags. All samples should be shipped as soon as possible after collection.



Rhizomes of Humulus lupulus L. should be cut into 2- to 3-inch segments for replanting.

© Joshua Havill

For more information about Havill's project, contact him via email at havill008@umn.edu Samples can be mailed to:

411 Borlaug Hall
1991 Upper Buford Circle
St. Paul, MN 55108

Havill, of Minnesota, uses the nomenclature Humulus lupulus. Flora of Colorado refers to western native hops as Humulus neomexicanus Rydb. MM

Stuck on Cacti: Cactus Workshop Attendees Find Many Species in Bloom

By Mary Menz



Don Campbell poses with his license plate that says it all. © Mary Menz

On May 12, Chinle Cactus & Succulent Society founder and former CoNPS member Don Campbell presented a cactus workshop and led a Plateau chapter field trip for a half dozen participants in Grand Junction.

Before heading to the Colorado National Monument to see cactus



Coryphantha missouriensis (Missouri pincushion) in bloom. This specimen is about the size of a quarter. © Mary Menz

in situ, Campbell shared with participants a photo presentation of native cacti. After the presentation, attendees ventured into the demonstration garden at the CSU Extension office located at the Mesa County Fairgrounds. Campbell helped design and build the demonstration garden in 2000. The garden, which is open year-round and free to the public, features more than 300 species and varieties of cacti, succulents, and other xeric plants.

The afternoon field trip included a walk guided by Campbell along the Old Gordon Trail in the Monument. The Old Gordon Trail is accessed via the Devil's Kitchen Trailhead near the east entrance to the park.

Originally a toll road built by John Gordon in the 1880s, the trail meanders through a seasonal sandy river bottom and slick rock formations dotted with flowering serviceberry, mountain mahogany, and cliff brush. Crevices in the rock also provide homes for many of the blooming Cactaceae family specimens found along the trail, including *Coryphantha*, *Echinocereus*, *Opuntia*, *Pediocactus*, and *Schlerocactus* species.

"It was interesting to see the variety of cactus in one place," said CoNPS member Lynn Lewis who attended the workshop.

"The cactus gardens at the Grand Junction Botanical Garden and at the Fairgrounds are gems among cactus and succulent gardens—comparable to those in subtropical

climates when it comes to variety and artistry," said Panayoti Kelaidis, senior curator and director of outreach at Denver Botanic Gardens. Kelaidis did not attend the workshop, but provided comment when asked about the Western Slope gardens.

"I believe that the design and maintenance of both gardens upstages most professional botanical gardens: I make a point of dropping in whenever I'm in the vicinity, and I think anyone who loves native plants will find the gardens to be dazzling!"



Workshop participants help locate *Pediocactus simpsonii* specimens, many of which are smaller than a quarter. © Mary Menz

Campbell, noted for his extensive knowledge about cacti, also designed the Western Colorado Botanical Gardens located on Strouthers Avenue in Grand Junction. It was built in 2002 and includes more than 200 different cold hardy succulent and non-succulent plants.

Spring Workshops a Hit with Members

By Lauren Kurtz

About 100 people have attended workshops and field seminars hosted by CoNPS this spring. The workshops were filled, and some even had a lengthy waiting list. There has been a balance of novice and advanced courses with a mix of taxonomy, landscaping, restoration, and pollinator study. Below are some highlights.



Presenters Carol Kerns and Diana Oliveras with participant Ryan Bartlett (center).
© 2018 Phyllis Pineda Bovin

In late March and early April, High Plains Environmental Center executive director Jim Tolstrup presented two workshops: *Designing with Native Plants for Pollinators* and *Restoring Native Open Spaces*. Attendees of the pollinator session toured the greenhouses where native plants are grown for landscape and restoration use. Attendees of the restoration class walked around the Houts Reservoir and surrounding areas, where there are fine examples of native restoration of riparian and prairie habitats.



A bumblebee crawls into a penstemon at the workshop. © 2018 Phyllis Pineda Bovin

Jim Tolstrup is an expert landscape designer and horticulturist with a passion for nature and wildlife.

Later in April, CSU professor and author of *Flora of Colorado* Jennifer Ackerfield presented a course on *Asters, Brasses, and Grasses*. The groups learned characteristics specific to these large families and practiced taxonomic identification with herbarium and fresh samples. Jennifer is an expert on plant taxonomy and was more than happy to share her expertise with the group.

In early June, there was a *Willow Identification* course at Golden Gate Canyon State Park with presenter Gwen Kittel. A group of 10 participants spent the first part of the day keying out herbarium specimens and the second half of the day was spent in the field identifying 12 species of willows in the park. Gwen shared copies of her *Vegetative Key to the Willows of Colorado* with the group.

Last, there was a half-day bumblebee field study at Denver Botanic Gardens Chatfield Farms with presenters Carol Kerns and Diana Oliveras. Both are professors of biology at University of Colorado Boulder and experts on bumblebees.

Attendees spent the morning sweeping the gardens for bumblebees and identifying them with a picture ID card provided by the presenters. Attendees caught and identified over 15 native bee species. All bees were released after identification.

There have been eight workshops as of June 1.

This is my first year working with CoNPS. I have been extremely grateful for the presenters' willingness to share their space and their expertise and I have been impressed by the participants' eagerness to learn and grow with CoNPS. We will have more sessions like this as the year goes on. Visit the CoNPS event calendar regularly to check out upcoming workshops.



Participants used a bumblebee key card to identify the species temporarily enclosed in a vial. © 2018 Phyllis Pineda Bovin

RMBL Field Station Reports Early Blooms

By David Inouye

Wildflower blooming at the Rocky Mountain Biological Laboratory (near Crested Butte, at 9,500 feet) was near-record early this spring, with spring beauty (*Claytonia*) flowering starting in mid-April on south-facing slopes. By the first week of June, there were already lupines flowering, and all the early-flowering species like spring beauty and glacier lilies (*Erythronium*) were finished, and the early larkspur (*Delphinium nuttallianum*) was winding down.

The timing of flowering at this altitude is strongly linked to snowmelt, and, for some species, the abundance of flowering is as well. So it's likely that the flowering at sub-alpine sites in southwest Colorado this summer will be unusually early for the rest of the season, and probably not very prolific. There seems to have been some interesting consequences of the fact that the ground froze, which it normally doesn't, in the absence of a deep snowpack to provide insulation.

For example, some of the developing glacier lily buds may have been frozen, and some bumblebee species may also have been affected.

RMBL is the location of a large number of pollination research projects, with people studying bee populations, hummingbirds, butterflies, and wildflowers, and their interactions. It's also where I've been studying the phenology and abundance of about 120 species since 1973, so we now have a massive database showing how flowering has been changing in response to climate change.

If you're in the area, stop by the visitors' center in Gothic and you can learn more about the research going on here.

David Inouye, PhD, is a principal investigator at RMBL and professor emeritus in the biology department at University of Maryland.

News and Announcements

Chapter Reports

Boulder Chapter News

By Erica Cooper, chapter president

In 2018, the Boulder chapter tried something new with its field trip schedule. The planning committee acknowledges with gratitude the amount of work field trip leaders contribute to the chapter's amazing trips. The committee also noticed that it can be hard to find enough dedicated leaders to lead as many field trips as our members would like to see. This year we added the Wandering Botanist program to the lineup--a chance for members to get out and look at plants with like-minded individuals without the pressure of a theme and program.

Wandering Botanist leaders meet folks on site but may have not visited the trail previously. Together, the group takes a pace that seems right for the individuals present, and all the while have an enjoyable time studying plants. These types of field trips can be enjoyable for amateurs and professionals alike, and we welcome new attendees. May 29 was a great example of Wandering Botanists in action, exploring the west side of the Joder Trail north of Boulder with Pat Butler.



*Melissa Dozier and Lynn Riedel observe plants living in rocky crevices at Sandstone Ranch.
© Erica Cooper*

◀ Other notable field trips included two trips to Sandstone Ranch east of Longmont. On June 2, four volunteers and four city of Longmont staff members worked in groups of two to develop a full plant list for a restoration area of about 23 acres. This area was previously dominated with cheatgrass, and volunteers were impressed with its transformation into a native-dominated grassland. The needle and thread grass was spectacular, and one volunteer even noted that they did not have to go to Pawnee National Grassland to see native prairie anymore as it is present at Sandstone Ranch.

Because of the rather small group, we did not finish inventorying all the acreage, but we look forward to scheduling more plant inventories in this area to help Longmont gather important post-restoration data.

The June 9 visit to Sandstone Ranch took a more traditional field trip route, as the 10 attendees learned about the natural history and restoration history of the area, while viewing native habitats off the beaten path and in closed areas. The chapter thanks Nate Schipper from the city of Longmont for helping organize and lead both of these field trips.

July and early August field trips occurred in the high country. Reports were not available for this issue. A late August trip to the southern Boulder County grasslands is on the docket. We hope to see more Boulder chapter members out on field trips and also welcome a September field trip if a leader steps forward. For questions or more info about the Boulder Chapter, please contact us at boulderconps@gmail.com



Metro Chapter News

By Lenore Mitchell, chapter president

In addition to monthly meetings—for which we thank our great speakers—other recent events include joining in with the North American Rock Garden Society (NARGS) for an April plant sale at DBG; a Front Range CoNPS-wide online plant sale in May and our annual garden tour in late June.

On August 22, the chapter honored great volunteers who have donated time to the chapter in various ways, from meeting speakers to field trip leaders, garden tour hosts and helpers, plant sale workers, and others who have stepped up when needed. We appreciate them all. The attendees enjoyed an evening picnic and presentations by DBG-Chatfield botanists.

Committee Reports

Horticulture Committee Launches “Monitoring Native Plants Program”

By Ann M. Grant

In June, the horticulture committee organized a tour of Habitat Hero Gardens in cooperation with the Audubon Society. Five gardens were on the Fort Collins tour, ranging from suburban to foothills, along with two bonus gardens that could be visited at any time. The sites included a public space near Manhattan Townhomes and a retail establishment and the Human Bean on College Avenue. More than 70 participants signed up for the tour.

In May, the Committee launched a pilot program for monitoring native plants in the garden. This project has been in development for a long time. It was reformulated in response to continued requests for information about how natives grow in home gardens and on small private properties. The program was launched at the spring native plant sale pick-up location at High Plains Environmental Center in Loveland. Two training sessions were held, one in

Loveland at HPEC and one at the CSU-Extension office in Fort Collins. Thanks to Jim Tolstrup and Karen Crumbaker for making those facilities available to CoNPS for this purpose.

This year, the horticulture committee has concentrated its efforts in the northern chapter area as both project coordinators for the Monitoring Native Plants in the Garden program are affiliated with that chapter. We invite members from other chapters to join us in other statewide efforts. Keep tabs on us in *Aquilegia* and through the CoNPS e-news.

To find out more about the monitoring native plants in the garden program, contact Linda Smith at conpsoffice@aol.com or (970) 663-4085, or visit the CoNPS website under the Resources tab. To join the horticulture committee in this or upcoming efforts, contact Ann Grant at odygrant@gmail.com or (970) 481-3065.

2018 Event Calendar

Chapter Meetings

(Please check the Events Calendar at CoNPS.org for updated information)

Boulder Chapter Meetings: 2nd Tuesday of the month (usually), Boulder Rural Fire Station, Gunbarrel, 7–8:30 pm
Events TBD

Metro-Denver Chapter Meetings: 2nd Tuesday of the month (usually), Denver Botanic Gardens, Plant Society Building; 6:30–8:30 pm
Sept 11: Cynthia Reiners, “Comparison of Tucson, AZ and Front Range Flora”
Oct 9: Carol English, “Moffat County Flora”
Nov 13: Tom Schweich, “Early CO Botanists and Colorado Flora”
Dec 11: Holiday Party, etc.

Northern Chapter Meetings: 1st Tuesday of the month (usually), Gardens on Spring Creek, Fort Collins, 6:30 social; 7-8:30 pm, presentations
Events TBD. Monthly meetings resume October 2.

Plateau Chapter Meetings
Events TBD

Southeast Chapter Meetings: Cheyenne Mountain Library, 1785 S. 8th St., Colorado Springs, 1:30 pm
Events TBD

Southwest Chapter Meetings: Lyceum in the Center for Southwest Studies, Ft. Lewis campus, 6:30-8:00pm
Events TBD

CoNPS Board Meetings:

Are you aware that anyone can attend the society's board meetings?
Sundays, 10 am to 1 pm;
October 21, December 2
Location TBD

Special Events

Plateau Chapter Special Event River and Riparian Management Workshop September 20, 9 AM to 3 PM

You are invited to a **workshop for White River riparian landowners and managers** to learn about local, state, and federal resources available for river and riparian restoration. The September 20 workshop will address important topics such as:

- Invasive vegetation control;
- Riparian buffers and other BMPs;
- Agricultural and conservation easements;
- Tamarisk beetle;
- Funding for vegetation management;
- Algae;

- White River fisheries; and
- Watershed stakeholder development.

The workshop will take place 9 AM to 4 PM at the Rio Blanco County Fairgrounds in Meeker, Colorado. The cost is \$10 and includes lunch. Register online at <https://riversedgewest.org/events/river-management-workshop>. This event is sponsored in part by the Colorado Water Conservation Board and Natural Resources Conservation Service.

CoNPS Fieldtrips

(Please check the CoNPS Event Calendar for details and up-to-date information.)

Boulder Chapter

August 31, 9 AM to 12 PM

Jewel Mountain, Jefferson County

Leader: Lynn Riedel

This is a late summer (xeric) tallgrass prairie field trip. Rocky Flats Mesa soils support a globally rare tallgrass plant community. August is the height of growth for this grassland community and it is a good time to get to know native grasses and mid- to late-summer grassland wildflowers.

It is relatively level terrain, but very rocky. Physical difficulty is #3 (#5 being the most difficult). We will hike approximately two miles. This trip is suitable for all levels of plant ID knowledge. There is no shade and it can be windy. Bring plenty of water, a hat, sunscreen, and appropriate clothing for cool or warm weather.

Meet at Highway 93 and the Denver Water Board Canal access road. Exact location and time to meet will be sent out via email prior to the trip.

Southwest Chapter

September 8, 8 AM to 3 PM

Lichens at Coal Bank Pass

Leader: Bob Powell

Meet up location: Animas City Park, Durango, 8 AM

There is no online reservation available for this trip. RSVP to Bob Powell at robertlpowell@durango.net or (970) 385-8949

We will drive US Hwy 550 to a multi-bouldered site at Coal Bank Pass where we'll have an introductory conversation of items and photos in a handout that will be provided. The structure and types of lichens will be described and specimens will be examined. We'll also study lichen sites nearby, including fruticose, foliose, gelatinous, and squamulose lichens and Pixie Cups.

After lunch, we'll drive to Lime Creek and walk a short distance to view other lichens such as orange rock posie, firedot, and sunburst lichens.

Bring light rain gear, a lunch, trail shoes, water, snacks, and a hand lens. Dogs are not allowed due to highway traffic. Limited to 12 attendees and four vehicles. Cost is \$5 to carpool.

Metro-Denver Chapter

September 8

High Line Canal

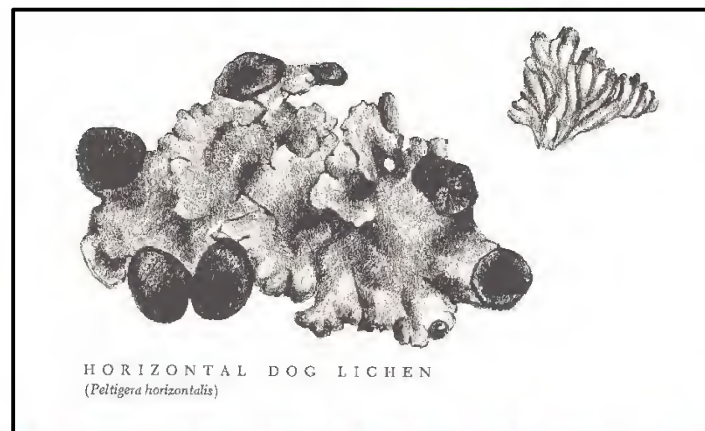
Leader: Chrissy Alba

The High Line Canal field trip will focus on how this manmade waterway shaped the plant communities along its stretches. Discover how the current-day vegetation is a mixture of native shortgrass steppe and riparian species, as well as non-natives that include garden escapees, water-loving "street trees" that you find in the city, and other accidentally or intentionally introduced non-natives. We should still be able to find some late-season plants in flower, so feel free to bring your favorite keys or other plant guides!

Meet at 10:00 AM in the parking lot located between High Line Canal mile markers 29 and 30 (latitude/longitude 39.60989, -104.9408). The parking lot is just north of Orchard Road, about one quarter mile to the west of S. Colorado Boulevard in Greenwood Village. There is no formal address associated with the parking lot.

We will start the field trip by walking downstream along the Canal. There is an outhouse in the parking lot that can be used before embarking on the walk. We will walk about two miles from the parking to mile marker 31, which will bring us to the entrance to the Marjorie Perry Nature Preserve. At this point, folks in the group can choose to explore the nature preserve or head back to their cars.

Type the latitude/longitude directly in Google and it will drop a pin where the lot is. You can then choose to get directions to the dropped pin. Please also see the map with the parking location and the locations of miles markers 30 and 31 at CoNPS.org.



"Lichen" Zwinger, Ann H. Beyond the Aspen Grove. (2002), Johnson Books

CoNPS Workshops

(To register for the workshops listed below, please go to CoNPS Calendar of Events website at conps.org.)

Vegetation Mapping and Land Management Decisions

September 29, Saturday, 9 AM to 3 PM

Lookout Mountain Nature Center

910 Colorow Road, Golden, CO

Presenters: Irene Weber and Anthony Massaro

How do you describe a plant community? How do you describe a landscape? This workshop will discuss vegetation mapping using both quantitative and qualitative methods and how land management decisions can be made using that information. This program will be aimed primarily at professional botanists and land managers, but anyone interested in parks, environmental policy, or plant communities may be interested.

Topics covered will include:

- Why map vegetation;
- Vegetation classification systems;
- Data collection systems;

- Field methods; and
- Translating your data into action.

The second half of the day will be in the field, weather permitting. Dress for the weather and wear sturdy shoes. Bring a lunch as there are not many quickly accessible lunch options.

Irene Weber is the Senior Botanist for Jefferson County Open Space. She has mapped vegetation across the US for the past decade and is currently working on mapping the 50,000 acre JeffCo Open Space system. Anthony Massaro is a botanist for Jefferson County Open Space who has been mapping the JCOS system for the past five years. Anthony has been pioneering new data collection methods for the county and can make a mean GIS map.

Cross Pollination Events

DBG Exhibit Features Juried Art by Students

The Denver Botanic Gardens' School of Botanical Art & Illustration opened its annual juried show August 15. The various student art features works in a variety of media.

Fans of the annual show will enjoy a well-established tradition demonstrating how students portray plants for scientific documentation and represent the beauty of the natural world. The show, called Invisible Links, explores the complex and often hidden symbiotic relationships between plants and other organisms.

DGB invites the public to experience the surprising diversity of creatures—including predators, pollinators, parasites and many others—whose lives are intimately connected with plants.

The show runs through October 14 in the York Street Gates Court Gallery.



Randy Raak, Bee-line, 2013, ink and watercolor on scratchboard.



Randy Raak, Alpine Diversity, 2017, watercolor.

More Events

WEBINAR

Historic Uses of Native Plants

September 25, 12:00 AM to 1:00 AM

CSU Extension Native Plant Master Program –
Metro-to-Mountain Group

Instructor: Susan Carter

This webinar will cover historic uses of native
plants including uses by the Ute people.

<https://www.eventbrite.com/e/webinar-historic-uses-of-native-plants-tuesday-sept-25-1200-noon-to-100-pm-tickets-41846174033>

September 6-9

Native Plant Society of New Mexico Annual
Conference

Plants, People and Culture of the Gila

Western New Mexico State University, Silver City, NM

<https://www.npsnm.org/events/2018-annual-conference>

September 10-12

19TH Annual Colorado Open Space Alliance
Conference

Two Rivers Conference Center, Grand Junction, CO

<https://coloradoopenspace.org/conference>

September 11-14, 2018

Colorado Parks and Recreation Association Annual
Conference & Trade Show

Snowmass Village, CO

<http://www.cpra-web.org/page/AnnualConference>

September 12 and 26

General Technical Report 373 Front Range Forest
Restoration Field Workshop Registration

Northern Front Range September 12

Southern Front Range September 26

<https://coloradoopenspace.org/wp-content/uploads/2018/07/GTR-Field-Trip-Flyer.pdf>

September 16 - 19

Rocky Mountain Section of the American Water Works
Association (RMSAWWA) and Rocky Mountain Water
Environment Association (RMWEA)

Joint Annual Conference in Denver, CO

<https://memberleap.com/Calendar/moreinfo.php?eventid=12006>

September 16-20

Annual International Symposium on Poisonous Plants
Red Lion Hotel & Conference Center, St. George, UT

<https://conference.usu.edu/ISOPP/>

September 18-20, 2018

Colorado Wildland Fire Conference

People, Places, and Perceptions - Wildfire and the
Human Condition

<http://www.wildfire-colorado.com/>

September 21-24

Oklahoma Native Plant Society Annual Meeting

Sequoyah State Park, Wagoner, OK

www.oknativeplants.org/annual-meeting.htm

October 18-21, 2018

Native Plant Society of Texas Symposium

A Meander Through the Native Plant Communities of
the San Antonio River Basin

Embassy Suites San Antonio Brooks Hotel & Spa
San Antonio, TX

<https://npsot.org/wp/symposium2018/>

October 20

Missouri Prairie Foundation Annual Meeting

Prairie Star Restoration Farm

Bland, MO

<https://www.moprairie.org/>

October 23-25

2018 Natural Areas Conference

University of Indiana, Indiana Memorial Union

Bloomington, IN

www.naturalareas.org/conference.php

November 14, 2018

Grow Native! Professional Member Conference

Missouri Prairie Foundation

<http://grownative.org/events/wednesday-nov-14-2018-grow-native-professional-member-conference/>

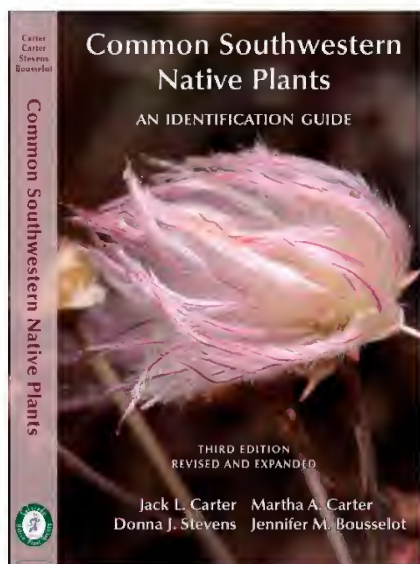
WANTED

Reporters and photographers
for the annual conference
and field trips.

Please contact Kelly Ambler
akelly4now@yahoo.com

New Books and Media

CoNPS Publishes Third Edition of *Common Southwestern Native Plants*



CoNPS recently published the third edition of *Common Southwestern Native Plants*. This new edition has been revised and expanded to include nearly 200 plants native to the southwestern United States, with a primary focus on the most common plants of the lower elevations of the four corners states.

while enjoying the beautiful photographs and technically accurate black and white illustrations. More advanced native plant enthusiasts will also enjoy this volume and will want to bring it along on a trip to the four corners region.

A short section on terminology and an illustrated glossary, as well as less common historical and medicinal uses, make both technical and non-technical descriptions pleasant to read.

Jack Carter, professor emeritus of biology at Colorado College is also the author of *Trees and Shrubs of Colorado* and *Trees and Shrubs of New Mexico*. Tree lovers will especially be drawn to the book's inclusion of record-holding trees and their locations.

Carter says the book is so colorful (thanks to several CoNPS photographers) and well formatted that it can be used as a coffee table book.

The Carters have generously donated this book to CoNPS. The Terra Foundation paid for publishing so that all proceeds will benefit CoNPS. Copies can be purchased online at the [CoNPS bookstore](http://conpsbookstore.com) at conps.org. For wholesale orders contact Jennifer Boussetot at conpspromote@gmail.com.

The 278-page book by Jack Carter, Martha Carter, Donna Stevens, and Jennifer Boussetot features two primary sections of gymnosperms and angiosperms. The angiosperm section is divided into trees, shrubs, vines, cacti, agaves and their allies, and herbaceous plants. Each subdivision is arranged alphabetically by family, encouraging the novice to look at every page

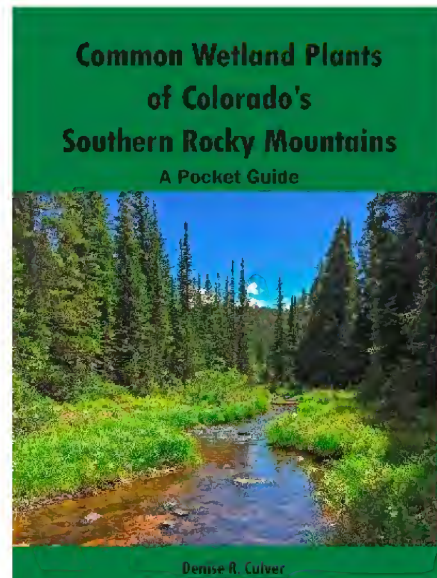
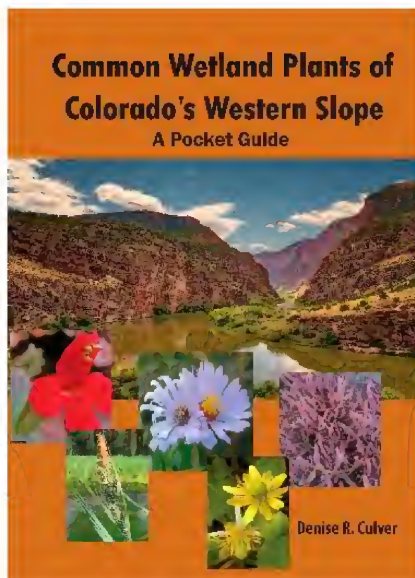
Two New Pocket Guides to Colorado Native Plants Now Available

The Colorado Natural Heritage Program is pleased to announce the completion of two pocket guides. The *Common Wetland Plants of Colorado's Western Slope* (190 pages) and *Common Wetland Plants of Colorado's Southern Rocky Mountains* (321 pages) builds on CNHP's ongoing effort to provide wetland professionals and the general public with essential tools to identify and assess Colorado's wetland resources.

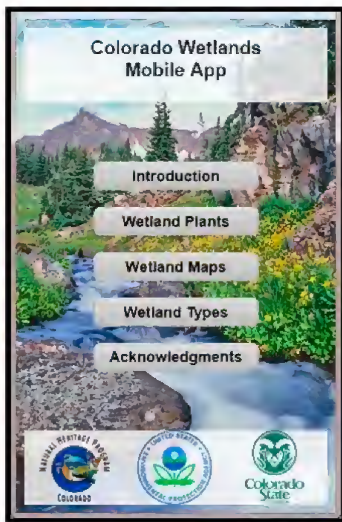
The two pocket guides by Denise R. Culver, CNHP ecologist, were produced as part of a US Environmental Protection Agency, Region 8, Wetland Program Development Grant with in-kind matches from Colorado State University and The Nature Conservancy.

The guides are free if you pick them up at the CNHP office in Fort Collins, or can be ordered for \$10 each to cover shipping and handling.

Contact Denise Culver Denise.Culver@colostate.edu to place an order.



Download Free Colorado Wetlands App



CNHP released last year a free mobile app called Colorado Wetlands. The smartphone app allows users to access detailed descriptions, photos, and plant data for more than 720 species found in Colorado's wetland and riparian areas. Users can search the app using several criteria including by plant characteristics and by wetland types. The app also provides access to digital National Wetland Inventory (NWI) maps for

the entire state of Colorado and can use location information from the device to show mapped wetland where the user is located.

Download the free app from Google Play (for Android devices) or the iTunes App Store (for iPhones and iPads).

DBG Releases New Field Guides

Denver Botanic Gardens released two new wildflower books this summer. *Wildflowers of the Rocky Mountain Region* was published in July. Written by 11 of DBG's horticulturists, the guide features 1,200 plant species commonly encountered in eight U.S. states and two Canadian provinces.

Each species account has a plant profile with a detailed description of it accompanied by a color photograph and a distribution map.

Other highlights include:

- An introduction to the region and to its life zones;
- Short descriptions of plant families;
- Morphological diagrams; and
- A glossary

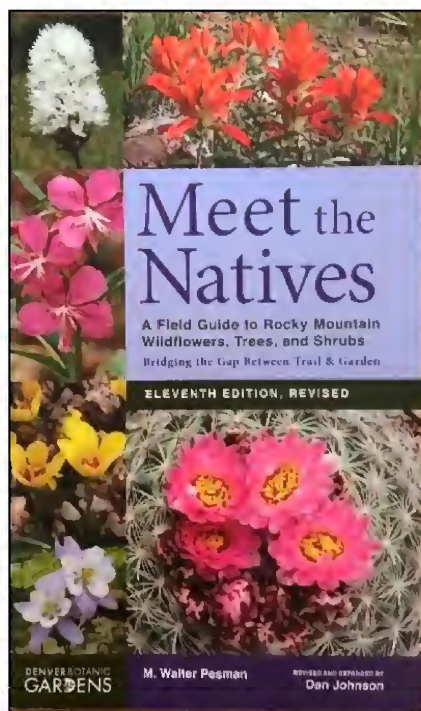
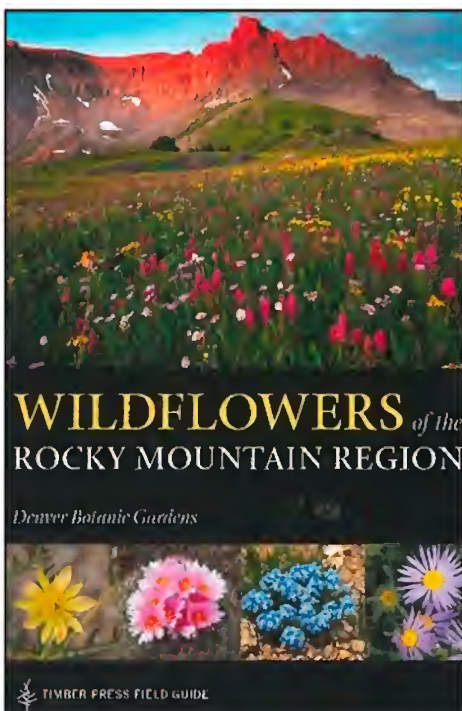
DBG also released the 11th edition of *Meet the Natives*. Originally written by M. Walter Pesman, this guide has been revised and expanded by Dan Johnson. The guide provides identification of wildflowers, trees, and shrubs found in the Rocky Mountains. This book also provides an expansive plant reference chart organized by common family name, genus, and species with determination of whether the plant is easy or challenging to grow in a garden.

Other highlights include:

- Discussion of life zones;
- Photographs organized by plant color; and
- Space to document where and when the species was found.

Both books are available from the CoNPS book store at

<https://conps.org/conps-store/> or from your favorite bookseller.



Wildflowers of the Rocky Mountain Region is dedicated to Loraine Yeatts and Janet Wingate for their decades of contributions to botany in the Rocky Mountain region and service to Denver Botanic Gardens.

Member Profile: Loraine Yeatts

by Lenore Mitchell

Loraine Yeatts, a long-time and well-known member of CoNPS and also NARGS (North American Rock Garden Society), co-authored the pocket-sized *Alpine Flower Finder* with Janet Wingate. A few months ago, Loraine drew a standing-room only crowd at a Metro-Denver chapter meeting for a fantastic floral slide show presentation tracing the Colorado river from its source in the heights of Rocky Mountain National Park to the river's demise in the Gulf of California. The emphasis was a virtual desert tour featuring some rare and special flora.

Yeatts grew up in Chicago and as young child was introduced to plants at an aunt's amazing flower garden. Gardening at home became a favorite activity, and trying to germinate plants was especially interesting. Germinating plants is still her favorite part of gardening. Seeds of plants she finds interesting during desert trips have been collected, germinated, and grown as houseplants or distributed to other gardeners. Many have become compost to nourish other plants.

Tucson was Loraine's home base for six years while she and her husband, Dick, pursued graduate degrees in physics. After their first son was born, she left school without a degree so Dick could finish his PhD and become the family breadwinner. Golden became the next home, where Dick was a professor at Colorado School of Mines. Their time in Tucson embedded in them a deep affection for the deserts' unique plants, so unlike the green landscapes where they grew up. Over the years, the diversity of plants in deserts and mountains all over the West have beckoned and amazed them.

Their oldest son is an archeologist for the Hopi Nation and a gardener who researches and grows heirloom vegetable foods used by Native Americans and South American indigenous cultures. Unusual fuzzy tomatoes are his specialty, along with Peruvian

potatoes, Hopi corn, and sunflowers. Their other son lives in the mountains and attempts to grow cool weather veggies, but usually the chipmunks deter his attempts.

Loraine's favorite plant is often the one she's seeing at any given moment, but alpiners rank highest followed closely by rare super blooms in the Southwest deserts. She says the beauty of an overlooked tiny, obscure flower as seen through a hand lens provides

a thrill equal to that of even her favorite showy alpiners. *Draba* (part of her email address) ranks right near the top, along with most *Androsace* and *Saxifraga* species, *Eritrichium nanum*, *Primula angustifolia*, and *Claytonia megarhiza*: common favorites of most who reach the alpine when these plants are at their glorious best. Favorite genera are *Astragalus*, *Penstemon*, and *Eriogonum*, still rapidly evolving with species that are difficult to classify taxonomically, and that have provided many hours of entertainment as well as involvement in specialty plant societies.



Loraine Yeatts exudes happiness in the field.
© Scott Dressler-Martin

Yeatts' botanical education began with the first visit to Denver Botanic Gardens to discover how to grow plants in the Colorado climate. She used macrophotography, her passion at the time, to record the amazing plants observed on frequent forays into the mountains. She soon realized that these plants needed names to make the photography worth the effort. Enter Dr. Helen Zeiner, volunteer curator of the Kathryn Kalmbach herbarium and Dr. E.H. Brunquist, retired physician and amateur botanist, who together led spring trips to view early blooming wildflowers in the foothills.

Brunquist was anxious to share his knowledge with her, a devoted student. After a couple of seasons, Dr. Zeiner invited Loraine to be a volunteer for the herbarium, which continued her lifelong quest to learn the Colorado flora. Shortly afterward, Jan Wingate ►

◀ became a volunteer and introduced her to Dr. Bill Weber, with whom she had been doing some fieldwork. After he realized Yeatts was serious about learning, they developed what, to her, felt like a father-daughter relationship. With absolutely no formal botany background, it was fortuitous and somewhat intimidating for her to have four PhDs as mentors, an opportunity for which she is eternally grateful.

During her 50 years at Denver Botanic Gardens, she accumulated several prized award pins which decorate her hat. Among the many memories: in 1986, Jim Borland, DBG propagator, was doing work for Rocky Mountain National Park and recommended that DBG herbarium staff conduct a floral survey for plants of special concern at the Park. Jan Wingate (grass and weed specialist), Peter Root (fern and *Botrychium* specialist), Mary Edwards, Velma Richards and Loraine, all volunteers at DBG, rose to the task. The project extended through 1994 with a couple of hiatus years when funds were not available.

The first year was a highlight as she and Dick (husband and Sherpa), took responsibility for exploring the restricted backcountry Research Natural Areas on three weeklong backpacks. Paradise Park felt like a step back in time to a previous century. The area was accessed by overgrown trails laced with fallen tree logs that had not seen human traffic since the 1940s when Bettie Willard and Ruth Nelson entered the area on horseback to document plants. At one campsite, Loraine found a badly tarnished silver spoon engraved with the initials BW. It was easy to

imagine Bettie losing it there. The early August flowers were amazing and Loraine's fern education grew by leaps and bounds. Loraine says it is still exhilarating to remember the emotional high experienced in each of these magnificent wilderness areas. Further surveys in the Park piqued her interest in wetland plants and carex species which provided bountiful study material.

Another amazing opportunity materialized in 1986 when the Rocky Mountain Chapter of the Rock Garden Society hosted an interim international rock garden society conference. Although she was not a member of the society, Andrew Pierce, conference coordinator asked Loraine to write a chapter on alpine plants for the book they were producing in lieu of proceedings and to present a slide program on alpinism as an evening speaker. Panayoti Kelaidis, pre-conference tour leader with Allan Taylor, invited her to be a tour guide since she was familiar with the flora of the Colorado Plateau. After these new and scary experiences, she joined the Rock Garden Society and learned how rewarding it is to share knowledge with those who are also passionate about plants. Loraine also found that teaching others was an excellent way to learn the subjects in-depth and cement that information in her memory.

Writing the *Alpine Flower Finder* with Janet Wingate was interesting and fun. Originally, they signed separate contracts with Tom Watts, producer of the *Finder* series. Jan agreed to do the *Rocky Mountain Flower Finder*, covering plains through subalpine zones and Loraine was to do



Loraine will go to any lengths for a good photograph..... © Bob Skowron



... And to any heights for native plants. © Nina Yeatts

◀ the *Alpine Flower Finder*. This came at the same time as the Rocky Mountain Park project, which totally occupied her time as project director where she was processing collections, keeping records, and writing reports. By the time Jan finished her book, Loraine had not even begun hers, so she gratefully accepted Jan's offer to write the key.

After Jan finished the first draft, she recruited Loraine as co-author since Loraine was more familiar with alpine plants. They brought complementary skills to the project. Jan's experience with developing a user-friendly key and technical drawing skill to emphasize the plant characteristics used in the key was invaluable. Loraine acted as editor, key tester, and layout artist for the publisher. The book required three summers of visiting as many mountain ranges in the central Rockies as time permitted to finish the project. In spite of writer's cramp, artist burnout, and cranky knees, they were satisfied to produce a fairly comprehensive user-friendly guide that filled a gap between photographic guides and technical floras.

Loraine notes some changes in botany over the years:

- There is a decline in generalist botanists, like William Weber, who have broad knowledge of the flora;
- The rise of specialists and the addition of genetic information to clarify the understanding of plant relationships is a growing field;
- There are increasing contributions of amateur botanists and citizen scientists; and
- There is growing access to instant information and knowledge-sharing on the web.

Loraine offers this advice to those new to wildflowers and Colorado flora: if you like puzzles, Sudoku, and you also love wildflowers, learning to ID them using a plant key is very entertaining.

If starting to use a key from scratch, choose one aimed at novices (such as *Alpine Flower Finder* and *Rocky Mountain Flower Finder*) to minimize technical terms. Have a glossary handy, a 10x or better hand lens, the internet for instant gratification after you reach a name for your plant, copious patience, and a friend who knows more than you do and is willing to answer questions.

Lenore Mitchell, the current Metro-Denver chapter president, is a long-time member of CoNPS and an avid amateur who has taught the Native Plant Master® courses for over a decade. Macro photography, hiking, and gardening with natives also keeps her busy.

Cercocarpus montanus

By Arthur Clifford

There is a rose upon the hill
It grows above the meadow
In wintertime its seeds will fall
To drill when fields are fallow

Arthur Clifford is a member of the Denver-Metro chapter. As a child, he spent many hours with grandparents who gave him a sense of home and of nature in the florist shop and greenhouse on their farm. He and his wife of thirty-five years live on a small acreage west of Sedalia, where he germinates Colorado native plants in his greenhouse.

© Arthur Clifford. All rights reserved



***Cercocarpus montanus*, Clear Creek Reservoir, October. © Kelly Ambler**

CoNPS Membership

Name _____
 Address _____
 City _____ State _____ Zip _____
 Phone _____
 E-mail _____
 Chapter (if known) _____

CHAPTERS: Boulder, Metro-Denver, Northern (Ft. Collins-Greeley), Plateau (Grand Junction & West Slope), Southeast (Colorado Springs-Pueblo), Southwest (Durango) or Unaffiliated

If this is a change in address, please write your old address here.

Address _____
 City _____ State _____ Zip _____

☐ **Check box to receive information on volunteer opportunities**

DUES include *Aquilegia* newsletter, published quarterly.

Most members receive the *Aquilegia* newsletter electronically.

☐ Check the box if you would like to receive the printed, black-and-white copy of *Aquilegia*.

Membership dues cover a 12-month period.

☐ New ☐ Renewal

☐ Student \$17 ☐ Senior (65+) \$17 ☐ Individual \$25
☐ Family \$35 ☐ Plant Lover \$50 ☐ Supporting \$100
☐ Patron \$250 ☐ Benefactor \$500 ☐ Life Member \$800

CONTRIBUTIONS to CoNPS are tax deductible:

John Marr fund for research on the biology and natural history of Colorado native plants \$ _____

Myrna P. Steinkamp Memorial fund for research and other activities to benefit the rare plants of Colorado \$ _____

Total included: \$ _____

Please make check payable to:
Colorado Native Plant Society

Send completed form and full remittance to:
 CoNPS Office
 PO Box 200
 Fort Collins, CO 80522



Fall Native Plant Sale

Did the spring sale leave you wanting more natives in your garden? Or maybe you missed the opportunity to purchase your favorite Colorado native plants?

Fall is an exceptional time of year to transplant; the soil is warm to encourage root growth and the weather is cool to reduce transpiration.

Place your orders now for pickup in September at the 2018 CoNPS Fall Plant Sale. Order plants until September 5. Pickup is scheduled for September 16 in Loveland at High Plains Environmental Center. Order plants on the CoNPS.org website.

The fifth annual spring plant sale was the largest yet: 222 gardeners added more Colorado native plants to their landscapes.

Thank you to everyone who has made the fundraiser possible, including the growers at High Plains Environmental Center and Harlequin's Gardens and the 33 volunteers.

The CoNPS plant sales not only forward the mission of CoNPS, but they are also a primary fundraiser for its nonprofit activities.



Can you ID these plants?

By Lenore Mitchell

(Answers below)



Answers (Clockwise from top left): *Gentiana parryi* (Parry's gentian or bottle gentian), *Gentianella acuta* (little gentian or autumn dwarf gentian), *Sweetia perennis* (star gentian), *Gentiana algida* (arctic gentian), *Frasera speciosa* (green gentian, elkweed, or monument plant). All are species of the Gentianaceae family. Photos © Lenore Mitchell, used with permission.

According to the Gentian Research Network and Rutgers University, gentians have figured in both prose and poetry worldwide since 1000 A.D. Emily Dickenson and D.H. Lawrence both wrote of gentians.



Colorado Native Plant Society

P.O. Box 200

Fort Collins, Colorado 80522

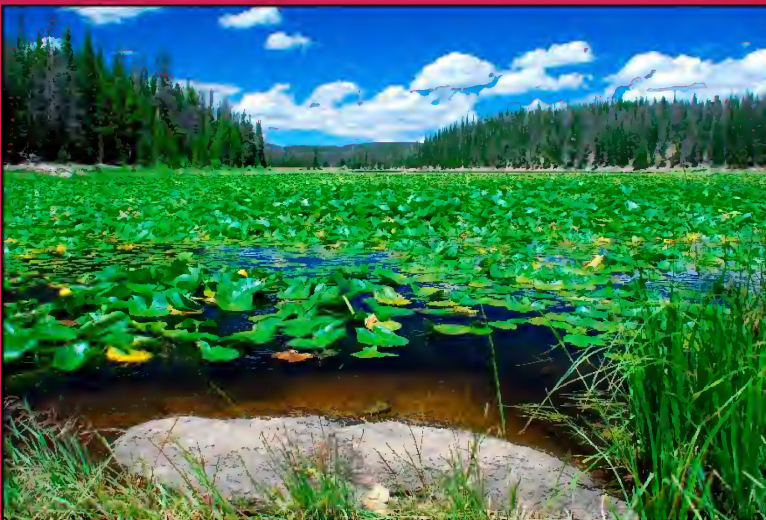
<http://www.conps.org>

CoNPS Fall Plant Sale

Order plants by September 5 at CoNPS.org. Pick up plants September 16 at the High Plains Environmental Center in Loveland.

CoNPS Annual Photo Contest

Deadline for submission of photos to the annual native plant photo contest is September 5. See CoNPS.org for instructions and entry form.



Lost Lake, 70 miles west of Fort Collins
© Laurie Paulik, CoNPS member, Northern Chapter

September 14-16

**CoNPS Annual
Conference
and
CSU Rare Plant
Symposium**

**“Knowledge, Advocacy,
and Change”**

Northside Aztlan Community Center
112 E. Willow Street
Fort Collins, CO 80524